SOCIAL SECURITY REFORM AND THE EXCHANGE OF BEQUESTS FOR ELDER CARE

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Abstract

The majority of elderly Americans who receive long-term care outside of institutions are cared for in part by their children. We have little evidence, however, on the financial and social mechanisms securing the supply of elder care. In recent data on older U.S. families, I find that children rarely receive direct payment for their help. Further, inter-vivos transfers from unmarried parents to their adult children do not favor caregivers. Given the lack of evidence of any spot-market for family care, the central question of this study is whether end-of-life transfers act as compensation for caregiving children. An empirical study of parents' division of bequests and life insurance among their children shows a positive association between children's transfer shares and both current and predicted caregiver status. In order to investigate the dependence of family care outcomes on children's time costs and parents' wealth and care needs, I present a dynamic model of the asset choices of an elderly parent who wishes to elicit care from her children. Model estimates indicate that children respond to parents' care needs and bequeathable wealth in the decision to provide care, and that children with greater time costs provide care only at higher levels of bequeathable wealth. Finally, a policy simulation based on model estimates predicts that a 5 to 6 percentage point increase in the rate at which unmarried elderly parents receive family care would result from reforms in which the expected present values of both public and private pensions were included in parents' bequests. However, a more modest change in public retirement benefits, designed to mimic the broad-brush characteristics of an existing proposal for Social Security reform, is predicted to have a negligible effect on care rates.

1. Introduction

According to the U.S. Department of Health and Human Services, more than 7 million Americans are informal caregivers providing unpaid help to older relatives, while 1.6 million elderly and disabled Americans receive care in nursing homes (HHS 2000). It is clear that family is the mainstay of long-term care for the elderly in the U.S. We have limited evidence, however, on the financial and social mechanisms securing the supply of such care, and how caregiving is likely to respond to changes in financial and social structures. An understanding of the process driving the intra-family supply of elder care appears to be of great potential value in predicting the long-term stability of existing sources of support for the elderly.

Due to its wealth of information on the health status, care sources, family ties, assets, and income of respondents, the Asset and Health Dynamics Among the Oldest Old (AHEAD) study provides a unique opportunity to examine patterns of long-term care receipt in a nationally representative sample of non-institutionalized older Americans.[1] I find that the children of the elderly are the most common sources of non-spouse care and sources of the most intensive care, providing approximately three times the total hours of care that members of the sample derive from paid and unpaid non-relatives and organizations combined. Further, parents who receive regular care from children report an average of 116 hours of such care per month. While most non-relative caregivers and caregiving organizations are paid for their services, only six percent of caregiving children are paid, and among paid children average hourly payments are far lower than the payments received by professional caregivers. In general, U.S. children make substantial time transfers to their elderly parents, and they are rarely compensated in a direct sense for their time.

The provision of elder care is costly to adult children, in terms of foregone wages, home production, leisure or some combination of these three. Pezzin and Schone (1999) find, in a data set on elderly parents and their adult daughters, that competing demands on daughters' time decrease both coresidence and informal caregiving. Given the observed absence of a spot-market for care within the family, the first question that this project

[1] McGarry (1998) establishes a comprehensive set of descriptive facts on the long-term care received by the full (married and unmarried) set of wave 1 AHEAD respondents.

seeks to answer is whether the cost of caregiving to children is compensated solely by the altruistic benefit of contributing to the parent's well-being, or in part by end-of-life transfers from parent to child that are conditioned on the provision of care.

I present evidence that parents do target transfers to caregiving over non-caregiving children. The observation that children who provide care to their parents are more likely to be included in a will or life insurance policy indicates a relationship between parents' transfer decisions and the caregiving behavior of their adult children. It is difficult, however, to determine whether this connection represents the interdependent altruism of parents and children or exchange in earnest within the family. More compelling tests of the exchange of parent-child transfers for elder care include the sign and magnitude of the change in transfers that accompanies the marginal hour of care, and the extent to which caregiving children with greater competing time demands are compensated more through transfers. Each of these two approaches requires some structure on parents' asset choices, the expected value of various retirement assets to parents and children and the child's caregiving decision.

In data on AHEAD families in which parents have multiple children and are single, widowed or divorced, I find that relative amounts of intended end-of-life transfers to children increase with the hours of care children give parents with current care needs. Further, unmarried parents who require ongoing care promise greater end-of-life transfers to children who are unmarried and have fewer children of their own. Other researchers have found that children with these family structure characteristics are more likely to provide care to their parents. For families with parents who do not currently require care, the AHEAD study includes information on which children (if any) parents expect to provide them with regular assistance should the need arise. Children who are predicted caregivers receive greater shares of parents' end-of-life transfers, and, when parents' predictions about children's caregiving potential are included in the estimation, the end-of-life transfers received by their children do not depend significantly on children's family structures or other correlates of caregiver status.

The distinction between caregiving and transfers as the result of coincident altruism and caregiving and transfers as the equilibrium of an exchange game is of interest for practical reasons, as well as academic ones. The two possibilities have starkly

different implications for the responsiveness of the intra-family supply of elder care to financial incentives, and therefore for its responsiveness to policy. The primary policy issue I consider in this context is Social Security reform. Feldstein and Ranguelova (1999) observe that some form of bequest benefit has featured in most recent policy discussions of investment-based Social Security reform. The addition of bequeathable retirement benefits would be costly to the Social Security system, either in terms of annuities paid out of or taxes paid into the system. Additionally, bequests represent a transfer of funds from the Social Security trust (or proposed investment accounts) to the non-elderly, rather than the elderly whom the system was founded to support. This observation might lead the reader to consider what social benefit would be derived from a shift from annuitized public retirement benefits paid to the elderly to bequeathable public retirement benefits paid primarily to the non-elderly.

One possible answer is that parents prefer, for one reason or another, to leave bequests to children, as evidenced by Bernheim (1991) using life insurance data, and by Laitner and Juster (1996) and Feldstein and Ranguelova (1999) using data on choices made by retirees with defined contribution retirement plans through TIAA-CREF. Further, if the relationship between elder care and bequests demonstrated in this research represents an exchange of bequests for care between parents and children, the establishment of a bequeathable component to mandated retirement saving through the public system could be expected to increase parents' ability to participate in this exchange. Such an effect would increase the intra-family supply of elder care. For this reason, I construct a model of the exchange of parent-child transfers for elder care, in which children are motivated to care for their parents by both altruism toward the family and an interest in exchange. I estimate the model of parents' asset choices and children's caregiving decisions, and recover primitive parameters of the problem that provide some evidence on the extents to which altruism and exchange motivate children's caregiving behavior.

Parameters derived in the estimation are then used to project the response of the supply of elder care within families and at different quantiles of the wealth distribution to changes in the structure of Social Security and private pension benefits. A first policy experiment investigates the change in the rate at which parents receive care from their

adult children in response to an extreme shift in the bequeathability of existing public and private pension claims, and a second experiment uses parameter estimates to project the effect on family care of a Social Security reform designed to mimic a subset of the benefit changes proposed in the report of the President's Commission to Strengthen Social Security as Model 2.

The remainder of this paper proceeds as follows. In Section 2 I describe the data set to be employed in the research, and I present evidence from the data on the prevalence and importance of unpaid long-term care hours provided by adult children to their non-institutionalized elderly parents. Section 3 provides evidence on the relationship between elder care and end-of-life transfers from parents to children. Section 4 sketches the theoretical and empirical model of the exchange of end-of-life transfers for elder care between parents and their imperfectly altruistic children. Section 5 describes the two pension reform experiments, and presents experimental results, and is followed by a brief section of concluding remarks.

2. Data and Evidence on Parents' Sources of Long-Term Care

This section presents descriptive findings on long-term care using data from the Asset and Health Dynamics Among the Oldest Old (AHEAD) study of U.S. residents born in or before 1923 and living outside of institutions in 1993. Findings are based on wave 1 of the survey, and the weighted sample proportions reported are representative of the population of non-institutionalized U.S. residents aged nearly 70 and above in 1993. One interest of this study is the sources of support for elderly individuals with chronic care needs. Among married disabled individuals the spouse most often provides care, and so we might expect single, widowed or divorced respondents to rely most heavily on children and non-family sources of assistance. For these reasons, tables 1 and 2 present information on the sources of care for all respondents and spouses in wave 1 of the AHEAD, and then separately for unmarried parents who report ongoing care needs in wave 1. I refer to the full AHEAD complement of 8222 respondents and spouses as the full sample from this point, and the group of 1381 unmarried parents with ongoing care needs as the restricted sample.

The following discussion defines an individual as a caregiver if the parent claims that the individual regularly provides her with assistance in the activities of daily living (ADLs), which include crossing a room, bathing, dressing, using the toilet, feeding oneself and getting in and out of bed, or instrumental activities of daily living (IADLs), including managing medications, shopping, preparing a hot meal, managing finances and using the telephone.

Children of elderly parents are by far the most common source of non-institutional, non-spouse care for the elderly in the U.S.[2] Table 1 shows that 21 percent of the full sample and 65 percent of the restricted sample receive regular assistance from someone other than a spouse. 69 percent of respondents receiving care in the full sample, and 82 percent of unmarried parents who claim care needs and receive regular care, are cared for by their children. Non-relatives and organizations provide substantial amounts of care to the U.S. elderly, though respondents report help from these sources only a fifth to a third as often as they report help from children.

The rate at which parents report care from their children in these and other data might be misleading if children are sources of intermittent support. Children may, for example, drop off groceries or check on parents' medications during occasional visits, while more time-sensitive or persistent needs are handled by outside caregivers. To address this concern, I calculate the average hours of care per month received by parents from each possible care source, given that the parent receives any care from the considered source.

In table 2, members of the full sample with regular care receive 117 hours of care per month on average, and those in the restricted sample receive an average of 122 hours of care per month. Hours of care from children conditional on receiving care from any child are comparable to average overall care hours conditional on any care, at 116 child hours per month in the full sample and 113 child hours per month in the restricted sample. Where table 1 demonstrates that children are the most common source of non-institutional care, table 2 shows children to be sources of the most intensive care.

[2] Sloan, Picone and Hoerger (1997) report that fewer than a quarter of the disabled elderly respondents in the 1989 wave of the representative National Long Term Care survey (NLTCS) reside in nursing homes.

Children of the elderly provide 2.7 (3.3) times the monthly hours of care supplied by non-relatives and organizations combined in the full (restricted) sample.

While family members are rarely paid for their assistance, a majority of non-relative caregivers and organizations are paid by the parent or some third party for the regular care they supply. Roughly half of non-relative caregivers in each sample are paid caregivers, and 66 and 75 percent of organizations providing care in the full and restricted samples, respectively, receive payment. Only 6 percent of children who provide care are paid in either sample. It appears that time transfers from children to parents are the norm in older U.S. families in which parents require long-term care, and that these time transfers are rarely associated with concurrent financial transfers from parents. Additionally, the reported hours and payment of the various care sources in the AHEAD study can be used to construct a rough measure of the hourly wages drawn by caregivers for their services. Not surprisingly, paid children, non-relatives and organizations provide more hours of care per month on average than their unpaid counterparts. I find that the 6 percent of parents who report paying children for care in each sample pay effective hourly wages of less than $1. Payments to non-relatives and organizations are 2.5 to 3.2 times as high on average, but all compare poorly to the 1993 U.S. minimum wage of $4.25.[3]

A small minority of parents receiving long-term care outside of institutions have help paying caregivers, and this help very rarely comes from children. I find that 11 and 12 percent of parents receiving care in the two samples also receive assistance with the payment of caregivers, and only 24 (16) of the 1717 (893) parents in the full (restricted) sample who receive ongoing care from some source report that their children help pay any caregiver. While time transfers from children to disabled elderly parents are the norm, financial transfers to support formal care are uncommon in these data.[4]

[3] Unless the observed care from non-relatives and organizations is generally provided in group settings, the average wages implied by reported care hours and payment raise concerns that either payments are underreported or hours are overreported. It is unclear based on the survey questions and patterns in the data which dimension of paid care is more likely to be misreported.

[4] It should be noted here that McGarry and Schoeni (1995) find that 7 percent of respondents in the first wave of the Health and Retirement Study (HRS) claim to make financial transfers to their parents. The HRS cohort, aged 51-61 in 1992, is the age of many of the children of the AHEAD respondents in 1993. This might lead to some concern that AHEAD parents' responses regarding transfers for care suffer from a receivership bias. Further, Engers and Stern (2002) find that side payments from children to parents for the

Though this may include some under-reporting of caregiver payment from children, the entries in tables 1 through 4 imply that roughly 8 percent of parents who receive regular care in each sample are cared for in part by paid non-relatives funded without the assistance of Medicaid, and that roughly 6 percent of parents receiving regular care in each sample derive some of it from paid organizations without the help of Medicaid. Given that there is overlap in each sample between paid care from non-relatives and paid care from organizations, and that 69 percent of parents receiving regular care in the full sample and 82 percent in the restricted sample are cared for by children, even with substantial under-reporting of cash transfers for caregiver payment from children it seems safe to conclude that time transfers from child to parent are the norm and cash transfers for care the exception. It is difficult to reconcile the observed failure of high-wage children to substitute paid private market care for transfers of their own time with rational economic decision-making without assuming that market care is an imperfect substitute for care from children, or that children are particularly productive caregivers.

3. Caregiving and Estate Division

This section presents evidence on the association between end-of-life transfers from parents to children and the hours of long-term care supplied to parents by children. Unmarried parents of only children provide a very simple environment in which to measure this association, and so table 3 is included as a first examination of the correlation between financial transfers and long-term care. We observe that, among unmarried older parents with care needs who have neither wills nor life insurance policies in their children's names, 17.65 percent receive ongoing care from their only children. However, among similar parents with wills or life insurance, 36.91 percent enjoy care from their children.[5]

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purpose of care or lodging take place in fewer than 10 percent of families (including childless families) in their sample drawn from the National Long Term Care Survey. This proportion is considerably larger than what I find using the AHEAD families, and this is likely to be due to some combination of increased transfers to parents receiving care in institutions and underreporting by parents.

[5] Brown (2003) includes further evidence of the correlation of end-of-life transfers and long-term care across families.

Having considered the correlation between end-of-life transfers and long-term care from children across families, one might also ask whether caregiving appears to be a factor in the division of end-of-life transfers among children in the same family. The set of parents used to study estate division consists of the subset of members of the full sample who are single, widowed or divorced and have two or more living children identified in the AHEAD data. I first examine the division of estates among children in families in which parents have wills or life insurance policies that treat children differently. As noted in section 3, while at least 71 percent of unmarried parents with wills and care needs divide their estates `about equally' among their children, 63 percent of unmarried parents with life insurance policies include some child and exclude another. In total, 260 unmarried parents with multiple children and ongoing care needs, with a combined total of 1055 children, divide their end-of-life transfers unevenly among their children. In addition, 266 unmarried parents with multiple children and no current care needs, who combined have 999 children, divide end-of-life transfers unequally among their children. I use data on these two family groups to estimate fixed effect models of the estate division choices of parents with and without care requirements.[6] [7]

Table 4 reports the results of several fixed effects specifications of the dependence of end-of-life transfers from parents to children on children's characteristics and actions. Children who provide care receive an expected increase in end-of-life transfers of $11,639 relative to their non-caregiving siblings. When the measure of care provided is weekly hours of care, the estimates indicate a $143 increase in end-of-life transfers to children for each weekly hour of care. Though this increase in transfers with the marginal hour of weekly care is positive and differs significantly from zero, given the life expectancies of the parents in the sample it amounts to a low hourly wage for long-term

[6] There is a concern here that parents select themselves into the set of unequal dividers based, presumably, on the same factors that determine the difference in bequests to children conditional on unequal division. Among parents with long-term care requirements and multiple children who met the data requirements for this sample, 291 have wills or life insurance and divide them "about equally" among their children. The behavior of this group may be explained by children who will not supply care at any feasible bequest level, children whose care hours are influenced equally by bequests or simply parents with motives other than the maximization of care hours from children for the division of their bequests.

[7] There are 3762 unmarried and unpartnered respondents in wave 1 of the AHEAD study. After removing respondents with demographic, care, and transfer information on less than two children included in the data, those with no bequeathable wealth or life insurance, and those who divide all bequests and life insurance equally among their children, 526 respondents remain.

care if children's caregiving activities are to be continued through the ends of their parents' lives. For example, the average hourly transfer wage to caregiving if all parents die in exactly one year would be $2.75. The low effective care wage makes pure exchange explanations for the observed association between hours of care and end-of-life transfers less convincing. Some altruistic motive for caregiving on behalf of the child seems necessary to explain the relative magnitudes of time and financial transfers in this interaction.

If measures of whether and how much weekly care is provided by each child in 1993 are imperfect descriptors of the amounts of long-term care children are likely to offer their parents through the ends of the parents' lives, then we might expect some parents with present care needs to bequeath positive amounts to children who currently provide no care. Given this concern, it would be ideal to have an indication of which children the parents in our sample expect to be caregivers in a lifetime sense. Understandably, the series of AHEAD questions regarding whether the parent hopes to receive care from her children should she require regular assistance in the future is asked only of parents without current care needs or assistance. Though I cannot include indications of whether children are expected to provide help in the model of estate division in families in which parents have care requirements, other child characteristics that influence children's membership in the caregiving set may be examined. Pezzin and Schone (1997, 2002) and Sloan, Picone and Hoerger (1997) find that children with spouses and larger numbers of children of their own are less likely to provide care for their parents. Table 4 coefficient estimates indicate that parents with care needs bequeath less to children with spouses and children of their own, perhaps suggesting that parents offer greater end-of-life transfers to children who are likely to be caregivers in a lifetime sense. Finally, table 4 estimates indicate that parents without current care needs transfer about $21,000 more in expectation to the children they expect to provide them care should the need arise in the future.

Models of altruistic bequests generally predict that parents compensate less well-off children, so that within the family we expect a negative relationship between the amounts bequeathed to children and children's permanent incomes under the hypothesis of

altruism.[8] The dependence of end-of-life transfers on children's years of schooling and an indicator for whether the child earns more than $30,000 shows no indication of compensatory transfers among families whose parents do or do not require care. Thus the estimates in table 4 are not consistent with the hypothesis of strictly altruistic transfers. The possibility remains, of course, that the caregiving potential of her children is not the sole determinant of a parent's estate division choices, but the empirical evidence does not indicate that the competing explanation of altruism is the reason that parents' bequests deviate from perfect dependence on caregiver status.

4. Model and Estimates

I consider the savings and bequest behavior and life insurance demand of a single, retired parent who has entered a poor health state and is in need of some amount of regular care. There exists a constant positive probability π in each period *t* that a parent who has survived to *t* will die before the start of period *t*+1. The parent acts to maximize her expected lifetime welfare function

$$EW(\{c_t, z_t\}_{t=1}^{\infty}) = \sum_{t=1}^{\infty} \beta^{t-1}(1-\pi)^{t-1}U(c_t, z_t),$$

where c_t denotes consumption in period *t*, β is a discount factor that takes a value in the open unit interval, and $z_t \in \{0,1\}$ indicates whether the parent receives regular care from a child who is associated with the parent throughout the problem. I choose an infinite horizon with constant probability of death so that, although the probability of surviving *s* additional periods approaches zero as *s* grows large, there does not exist an age *T* such that the parent who has lived to *T*-1 (and her child) knows with certainty that she will die before the start of the next period.

The parent holds initial bequeathable wealth B_t and receives income in the form of a constant annuity flow *A*. In each period she may purchase a life insurance policy with face value L_t at the fair premium rate $\frac{\pi}{1+r}L_t$, where *r* is the market rate of return on investment. Borrowing against expected future *A* payments is disallowed to reflect the

[8] See, for example, Becker (1974) and Wilhelm (1996).

illegality of borrowing against future Social Security benefits, and so in each period the constraints on the parent's savings are

$$B_t \leq (1+r)B_{t-1} + A - c_t - \frac{\pi}{1+r} L_t \text{ and } B_t \geq 0 \ \forall t.$$

The level of care in each period is chosen by the child. I assume that the child's problem is stationary. In each period she determines a reservation value in expected bequests from the parent, above which she will offer care. The reservation value is a function of her observable and unobservable characteristics in that it reflects the opportunity cost of time spent caring for the parent and any psychic cost or benefit of supplying care. Her decision can be represented as the z_t function

$$z_t = 1 \text{ if } R \leq \pi((1+r)B_t + L_t)$$
$$0 \text{ otherwise,}$$

where R is the reservation value and is constant over time. Note that the parent may meet the child's reservation value through her selection of B_{t} and L_{t}, and that the child values planned transfers from the parent more when the parent faces a higher mortality probability.

The parent chooses c_t and L_t in each period, given her own asset process and the child's care response. In the solution and estimation I assume that

$$U(c_t, z_t) = \ln(c_t) + \delta z_t.$$

The parent's problem is

$$\max_{\{c_t, L_t\}_{t=1}^{\infty}} \{\sum_{t=1}^{\infty} \beta^{t-1}(1-\pi)^{t-1}(\ln(c_t) + \delta z_t)\}$$

$$s.t.\ B_t \leq (1+r)B_{t-1} + A - c_t - \frac{\pi}{1+r} L_t,$$
$$B_t \geq 0 \ \forall t \text{ and}$$
$$z_t = 1 \text{ if } R \leq \pi((1+r)B_t + L_t)$$
$$0 \text{ otherwise.}$$

The parent receives the full benefit of care where an amount L_t of life insurance is purchased such that $R = \pi((1+r)B_t + L_t)$, implying that the parent's total bequeathable assets just meet the child's reservation value. The marginal value of life insurance above

the critical $L_t = \frac{R}{\pi} - (1+r)B_t$ is zero. Since the parent receives no benefit from the insurance outside of care, the optimally chosen insurance in any period must be either zero or $\frac{R}{\pi} - (1+r)B_t$.

The parent follows one of four possible patterns of dissaving, insurance ownership and care receipt from period t, depending on the values of state variables *A*, *R* and B_{t-1}. Figure 1 depicts the four possible shapes of the path of dissaving over time, starting from four distinct sets of (B_{t-1}, A, R) values, and Table 5 reports the regions of the state space in period t that place the parent in each of the four possible cases. In a given period t, either B_{t-1} is high enough that the parent can save $B_t \geq \frac{R}{\pi(1+r)}$ and receive care without life insurance, or $B_{t-1} < \frac{R}{\pi(1+r)^2}$ and the parent must immediately decide whether to purchase the amount of life insurance required for care. A parent with high savings relative to the child's reservation value in a given period enjoys care from the child in the absence of life insurance, and follows a path of dissaving resembling either the case (*iii*) or case (*iv*) path depicted in Figure 1. A parent with low savings relative to the child's reservation value in a given *t* chooses between buying $L_t = \frac{R}{\pi} - (1+r)B_t$ and receiving care, in which case she follows a dissaving path that resembles the case (*ii*) path in Figure 1, or buying no life insurance and foregoing care, in which case she dissaves according to the case (*i*) path in Figure 1.

The relative values of state variables B_{t-1} and *R* determine whether the parent derives care from the child without purchasing life insurance. However, if we fix the values of B_{t-1} and *R* such that the child provides care only when the parent purchases life insurance, then it is the value of the third state variable, annuity income *A*, that determines whether the parent prefers life insurance and care (case (*ii*)) or no insurance and no care (case (*i*)). At and above critical annuity income level $\bar{A}(B_{t-1}, R)$ the parent chooses to maintain the life insurance policy required for care to the horizon. Below this critical annuity income level, she prefers to dissave out of bequeathable wealth, purchase

no insurance, and receive no care in each subsequent period. A similar structure emerges from the distinction between cases (*iii*) and (*iv*) for a parent with a large amount of bequeathable wealth relative to the child's reservation value. Fixing B_{t-1} and R such that the parent may save enough to receive care without insurance in period t, the parent follows either the case (iii) or the case (*iv*) dissaving path. For annuity income at and above a critical $\overline{A}(B_{t-1}, R)$, the parent prefers dissaving path (*iii*). She dissaves out of bequeathable assets until $B_t = \frac{R}{\pi(1+r)}$, at which point she maintains this amount of savings to the horizon. Such a parent receives care from the child in every period. Alternatively, if $A < \overline{A}(B_{t-1}, R)$ the parent prefers to follow the case (*iv*) savings path, eventually allowing savings to drop below $B_t = \frac{R}{\pi(1+r)}$ and relinquishing care.

The model of exchange is estimated cross-sectionally using the AHEAD sample of 1051 single, widowed or divorced parents with ongoing care needs and adequate asset, demographic and care information reported. The further sample restriction that all parents have nonnegative bequeathable wealth is necessitated by the imposition of the $B_t \geq 0$ constraint. Forty-two parents with negative bequeathable wealth are removed from the sample. Finally, I exclude the wealthiest 9.6% of parents from the sample, leaving 912 families to be included in the estimation.[9]

The measurement of bequeathable, annuitized and insurance assets in the data proceeds as follows. I include all standard assets, housing, and business wealth and any non-annuitized pension benefits in bequeathable wealth, as well as the present value of any income that continues after the date of the death of the parent. In the reported version of the estimates, annuity income is measured as the sum of Social Security, veteran's

[9]There are two motivations for removing the wealthiest members of the sample. First, parents with wealth above $600,000 in 1993 dealt with more complicated bequest concerns because federal estate taxes applied only above this threshold. Second, the involuntary annuitization of retirement savings under the Social Security program occurs up to an income ceiling, above which life insurance, one of a limited set of sources of identification in this problem, is of less value to the parent. One might also argue that public interest in the ability of wealthy retirees to support long-term care is limited. In general, I find that the model fit worsens as I include parents in the upper tail of the wealth distribution, and this effect is examined further in Brown (2002).

benefits, and any private pension income that is contingent on the parent's survival.[10] My measure of life insurance is the face value of the largest term life insurance policy the parent owns, if the policy names a child as beneficiary.[11] A parent is recorded as a care recipient if she reports that she receives 'regular assistance' from one of her children.

Since the expected value to a child of future end-of-life transfers from her parent depends heavily on the parent's mortality probability in the model, I allow parents' mortality probability to vary in the estimation by age and a self-reported health status measure available in the AHEAD as it does in the sample of parents from the first to the second wave of the AHEAD.[12]

The functions of the observed parent's savings and annuity income and the child's reservation value in the estimation follow the above discussion rather closely. Children's reservation values and parents' benefit from care are allowed to vary in the population.

The costliness of caregiving to the child may depend not only on observable factors such as income and the structure of the child's family, but also on some unobservable quality of the parent-child relationship. To account for this possibility, the empirical specification admits heterogeneity across families in the cost of care for the child, both as a function of observable child characteristics and through an additional reservation value component that is assumed to be fully observable to both the parent and the child but unobservable to the econometrician. The cost of care to the child is assumed to be a function of her observable characteristics X and the family-specific unobservable ε, such that

$$R = X\alpha + \varepsilon,$$

where $\varepsilon \sim N(0, \sigma_\varepsilon)$ in the population and is independent across families.

[10] Parts of the estimation have been repeated with annuity income consisting only of Social Security and Veteran's Benefits, components subject to legal collateral restrictions, and the qualitative results do not change.

[11] Unlike term insurance, whole life insurance policies contain both savings and insurance components. Without information on the length of time that the parent has held a whole life policy, I am unable to separate the policy into term and savings components. For this reason I exclude measures of whole life insurance from the estimation.

[12] Fifteen age-health status categories are constructed, as the cross of (69-74, 75-79, 80-84, 85-89, 90+) and (excellent, very good or good, fair, poor), and one-year mortality probabilities are derived from observed mortality in these categories. More information on this process is available in Brown (2002). Mortality data based on a larger, more representative sample of older Americans, such as those available from the Social Security Administration, are not employed because parents with current care needs are observed to experience much higher mortality rates than these would indicate.

Vector X of child characteristics includes various measures of the value of the child's time and the extensiveness and nature of the parent's care needs in model specifications (1)-(6), with coefficient estimates for each reported in table 6. The flexibility in the location of R and the specification of the dependence of R on family characteristics is intended to allow for the possibility of both altruistic and exchange motives for children's caregiving behavior.

Since child earnings are clearly endogenous to the caregiving decision, the best available measure of the value of children's time spent in caregiving is children's education. The child's education is measured in years of schooling, with a median of twelve representing completion of high school. Two measures of the education of a parent's children are employed alternatingly in specifications (2)-(4) and (6), the minimum of her children's educations and the education of the child predicted to be the most likely caregiver. The coefficient on each education measure is free to be positive or negative in the estimation. A positive coefficient on the education measure would provide evidence that, all else equal, the end-of-life transfer from the parent at which the child is willing to provide care increases in the market value of the child's time. A negative coefficient would indicate that children with more years of schooling provide care at lower promised bequests, all else equal, perhaps indicating that education is associated with duty to family, or the resolution of an implicit lifetime exchange agreement in which the parent pays for the child's education.

Additional characteristics of the family included in X are the numbers of activities of daily living (ADLs) (crossing a room, dressing, bathing, eating, getting in and out of bed, using the toilet) and instrumental activities of daily living (IADLs) (preparing a hot meal, shopping for groceries, making telephone calls, taking medications, managing money) with which the parent requires assistance. ADLs may represent more time-sensitive or onerous care requirements, while IADLs are generally more time-flexible and perhaps less onerous. A positive coefficient on either care requirement measure would indicate that children assist parents with greater care needs only at higher bequest levels, all else equal, and could be taken as evidence of exchange. A negative coefficient on either measure would indicate that children respond positively to parents' care needs in their

decision to provide assistance, providing more care to needier parents at any level of intended bequests. This result would provide evidence of altruism in family care.

Finally, the reservation value distribution itself should provide information on the relative importance of altruistic and exchange motives for care. The assumption of a normal distribution for ε implies that *R* has positive density over the whole of the real line. To the extent that the mass of the *R* distribution lies in the positive region, children weigh their parents' bequests (along with other factors) in their decisions to provide ongoing care. The density in the negative region indicates the proportion of families in which children provide parents with the required level of care independent of any financial transfers.

In order to map the behavioral model to one that can be estimated, I must also allow for heterogeneity in the benefit parents derive from care. δ is assumed to follow an exponential distribution in the population with parameter $\lambda > 0$, so that its density function is

$$f(\delta) = \lambda e^{-\lambda\delta} \quad \delta \geq 0$$
$$0 \quad \text{otherwise.}$$

Limiting the region of possible δ values with positive density to $\mathbb{R}^+$ ensures that each parent benefits from care, and the heterogeneity in δ allows some parents in the population to benefit more than others. δ is assumed to be distributed independently across individuals. Without the assumption of heterogeneity in δ values, the model predicts that the parent purchases some observed life insurance amounts with zero probability.

Finally, to accommodate parents with life insurance policies and no care from children, I assume that there exists a second life insurance process that follows a truncated normal distribution. Latent life insurance holdings as a result of this second process are

$$\tilde{L}^2 = \eta,$$

where $\eta \sim N(\mu_\eta, \sigma_\eta)$ in the population and is independent across individuals. The outside demand factor may be thought of as a non-standard form of reporting error in life insurance holdings, demand for funeral insurance, or inertia in life insurance holdings

from the pre-retirement period. I further assume that there is no overlap in insurance demand, so that where $\tilde{L}^2$, which I will refer to as inertial insurance, is greater than zero, all observed insurance is inertial insurance. In this sense, observed families in which parents have life insurance and receive no care from children contribute to the estimated probability that insurance is held for non-exchange reasons.

The model is estimated using standard maximum likelihood techniques. Information on individual families' assets and care decisions contributes to the likelihood in several ways. The observed savings of a parent who receives care and does not purchase life insurance provide an upper bound on the reservation value of the child. Similarly, the savings of a parent who buys no insurance and receives no care imply a lower bound on her child's reservation value. A parent with high annuity income who fails to purchase enough life insurance to receive care must have a low benefit from care relative to the consumption cost of meeting the child's reservation value. Finally, a parent with a life insurance policy who receives care fully reveals the child's reservation value through her purchase of the optimal $L_t = \frac{R}{\pi} - (1+r)B_t$. She must also have a high enough utility benefit from care to justify the insurance purchase. In this manner, the model estimation asks whether children's willingness to help their parents increases with parents' bequeathable wealth without responding to parents' annuitized wealth. In fact, parents with high annuity income who receive care produce upward pressure on the estimates of children's reservation values in bequests through their bequeathable but not their annuitized assets, and parents with high annuity income who fail to purchase insurance and receive care provide evidence of an unwillingness of families to engage in exchange through their influence on estimates of both R and δ.[13]

Estimates based on six specifications of the model are reported in table 6. All estimates are derived under the assumption that the market rate of return is 0.03, and estimates reflect the scaling of all financial variables (annuity income, bequeathable wealth, the reservation value and life insurance) to units of $2,000. For ease of exposition, we consider at this point the best-fitting version of the model, specification

[13] This approach resembles the approach of Bernehim, Schleifer and Summers (1985), in that it separates the parent's lifetime resources into bequeathable and annuitized components and investigates the distinct influences of each on services supplied to the parent.

(6) in table 6.[14] The independent variables included in X_i in specification (6) are a constant, the minimum child education among the children in family *i*, the number of children in family *i*, the number of IADLs with which the parent requires help and the number of ADLs with which the parent requires help.

Estimates of the parameters describing the reservation value distribution are consistent with a number of the predictions of the exchange hypothesis. The common intercept across families in the child's reservation value estimated in specification (6) is positive and precisely estimated, as is the coefficient on the minimum child education. It is evident from the coefficient estimates that the child of the representative family provides care only at a positive level of expected bequests, and that the bequest level at which children are willing to provide care increases with their education, all else equal. Under the assumption that the child's education is a good measure of her labor market opportunities, bequests that increase with education in the event of care provide evidence that parents compensate children for the value of their time.[15] Finally, descriptions of the reservation value distribution based on 1000 simulated reservation values for each sample family using on specification (6) parameters imply an average reservation value in expected bequests of $12,260, and indicate that 76 percent of sample children require strictly positive bequeathable wealth in order to provide care.

The above estimates of the mean reservation value and the effects of education on expected transfers to caregivers are consistent with the predictions of the exchange model. At the same time, the estimates reported in table 6 suggest a substantial amount of altruism in caregiving. In specification (6), the estimated coefficient on IADLs is negative and highly significant. Parents who require more help with cooking, grocery shopping, using the telephone, managing money and taking medications more often receive care from children at any bequest level. Such responsiveness in observed elder care to parents' needs is presumably evidence of altruism. ADL requirements, on the other hand, do not elicit more help from children. The coefficient on ADL requirements is positive but insignificant. We might expect a positive coefficient on care needs if

[14] See Brown (2002) for analysis of the sensitivity of the parameter estimates to the specification choices presented here.

children respond to more onerous care requirements from parents by increasing the expected transfer above which they provide care. The sign of the coefficient on ADL needs in specification (6) is consistent with an exchange story of this sort, but the coefficient is estimated very imprecisely. What one can conclude from the estimation is that children do not provide more care, fixing expected transfers and other characteristics of the family, as their parents require more assistance with crossing a room, dressing, bathing, eating, getting in and out of bed, and using the toilet. Returning to Table 6, parents' mortality probabilities behave similarly as ADL and IADL requirements increase, so the difference in the directions of their influence on the reservation value does not appear to be driven by the contribution of the individual mortality probability to the expected value of transfers.

Additional evidence of altruism in caregiving is found in the observation that the simulated *R* distributions indicate that 24 percent of the families in the sample include children who would provide the required care to their parents in the absence of any end-of-life transfers. Clearly a large segment of children who provide care are compensated only through the altruistic benefit of assisting their parents.

Table 7 presents the proportions of the sample families who are observed in each of the four life insurance-care outcome categories, and compares these with average proportions of families in each of the insurance-care categories over 1000 simulated outcomes per family using parameter estimates. This comparison is offered as one measure of the fit of the model. It is evident that the estimates have captured the broader patterns in the data. 12.61 percent of families in the data appear in the insurance and care category, as compared with 8.53 percent in the simulations. 28.63 percent of parents in the data have no insurance and receive care, while 28.15 percent of families in the simulations land in this outcome category. 43.08 percent of parents in the data and 54.49 percent of parents in the simulations have neither insurance nor care, and, finally, 15.62 percent of parents in the data as opposed to 8.84 percent of parents in the simulations hold life insurance that is not associated with family care. The shortcoming of the model lies in its under-prediction of life insurance demand, in favor of the no insurance-no care

15 Note that the positive association between bequests and child's education in the event of care is observed while conditioning through the model structure on the association between bequests and child's education in the absence of care.

outcome. This underprediction is most severe where limited information on the exogenous characteristics of family members is included in the estimation. In these cases, the predicted *R* distribution has a high variance. As more pertinent information about family members is included in the estimation, the dispersion of the predicted *R* distribution decreases, and therefore the probability mass over the reservation value region in which the parent has reason to demand insurance increases, lessening the underprediction. Further discussion of model fit can be found in Brown (2002).

5. Counterfactual Policy Experiments: Pension Reform

The estimates derived in the previous section suggest that both altruistic and exchange motives play roles in the determination of the amount of long-term care children provide their parents. Further, these conclusions are based on the responses of caregiving behavior to observable factors that vary by family. As discussed in section 1, if children are largely altruistic in their caregiving behavior, and determine the number of hours care they provide their parents based primarily on parents' need, then family care is unlikely to be responsive to financial incentives such as increases in the bequeathability of parents' retirement assets or tax credits for caregiving. However, if the amount of family care provided results largely from exchange within the family, then such financial incentives for elder care may be effective at increasing the amount of care from children disabled elderly parents in the U.S. enjoy, and public or private pension systems that offer both bequeathable and annuitized benefits may offer elderly parents leverage in the intergenerational exchange.

For these reasons, we may be interested in the relative importance of the altruistic and exchange factors in the caregiving decision identified above. One manner of addressing this question is to use parameter estimates derived from the estimation in section 4, along with family-level information on parents' assets and the observable characteristics of parents and children that influence the caregiving decision, to predict the effects of changes in the structure of the observed parents' public and private pension benefits on rates of family caregiving and parental welfare. The practical question motivating the experiment is whether a meaningful increase in the amount of care

provided to the elderly can be achieved as a part of the ongoing shift of private pension and Social Security benefits from full annuitization to more bequest-heavy formulas.

The following two counterfactual policy experiments, using the AHEAD sample of single, widowed or divorced parents with ongoing care needs and based on the parameter estimates from model specification (6), investigate the responsiveness of family care to (1) an extreme conversion of public and private pension claims to more bequeathable formats and (2) a more realistic change in the bequeathability and withdrawal options in the public retirement benefit alone.

Policy experiment 1 In this experiment, I impose a new, unexpected bequest structure on presently annuitized Social Security and private pension benefits. The bequest benefit follows the most generous plan for Social Security bequests evaluated in Feldstein and Ranguelova (1999). I calculate the probability of each insurance-care outcome under the new benefit structure and compare the elder care supplied within families under the current and proposed systems. Though the extreme and simultaneous shift in the bequeathability of Social Security benefits and private pension assets for this older cohort is implausible at best, the exercise serves to examine whether any change in families' caregiving behavior is possible as a result of the manipulation of realistic levels of retirement wealth, and for populations whose long-term care sources may be of some policy concern.

Feldstein and Ranguelova devise a personal retirement account plan including both debt and equity holdings for Social Security retirement savings. They then measure the likely cost, in terms of either savings paid into or benefits paid out of the accounts, of including various bequest plans for Social Security benefits. The most generous plan they specify for the bequeathable component is one in which heirs of the plan beneficiary receive the present value of expected future annuity payments from the account at the death of the beneficiary. This bequest structure is costly in terms of annuitized benefits, but has the advantage that it provides a bequest benefit to the retiree at any age. I specify a bequest benefit analogous to this one in the terms of my model, which I must assume is implemented unexpectedly, and I use it to explore the potential for incentivizing intra-family elder care through bequeathable retirement benefits.

In the context of the model developed in section 4, a retirement benefit plan in which the parent receives both annuitized income and the right to bequeath the present value of expected future benefits to a beneficiary at the time of her death would have an expected cost of

$$\frac{Ak}{1-\frac{1-\pi}{1+r}}+\frac{\pi Ak}{(1+r)\left(1-\frac{1-\pi}{1+r}\right)^2},$$

where k imposes a proportional decrease in the benefit A from that received under the current system. In order for the expected cost of the proposed program to equal the expected cost of the existing benefit program in the model, the decrease in the annuity payment must be such that

$$k=\frac{1}{1+\frac{\pi}{(1+\mathrm{r})\left(1-\frac{1-\pi}{1+r}\right)}}.$$

Under the assumption that $r=.03$, and using the parameter estimates from specification (6), I apply the new benefit regime to each observed family. I assume that the government and private pension fund base bequest payments to heirs on age-appropriate mortality rates, so that the value of π employed in this formula varies with the beneficiary's age but not her health status. I decrease each parent's annuity income from A to the implied Ak, and I add $\frac{Ak}{1-\frac{1-\pi}{1+r}}$ to the bequeathable wealth of each parent.

It is worth emphasizing that the effects of this surprise change in policy may differ substantially from the long-term effects of a permanent change in the retirement benefit structure. In the context of the particular model presented in this paper, I am unable to allow parents to respond to the changes in benefits in their pre-retirement or even pre-interview savings behavior. Further, the Social Security reform entailed in this stylized revision of the parents' annuity income does not reflect any of the likely changes in the rate of return or risk associated with work-life savings through Social Security under existing reform proposals. Since my ability to study the welfare implications or the influence on lifetime savings of a change in retirement benefits of the sort applied in this

section is limited, my goal is to construct evidence on whether a sizable shift of retirement benefits from a fully annuitized to partially bequeathable character can bring about any meaningful change in the amount of care supplied by children to elderly parents.

Policy experiment 2 The second pension benefit reform examined is intended to reflect a more realistic change in Social Security benefits, with no change in annuitized private pension income. The income security, withdrawal choice and bequeathability characteristics of the Social Security portion of observed annuity income are adapted in manners intended to mimic the income security, withdrawal choice and bequeathability characteristics of the Model 2 reform proposed by the President's Commission to Strengthen Social Security.[16]

The simulated reform creates a Personal Retirement Accounts (PRA) for the amount of the parent's annuity income that is in excess of the Social Security income floor chosen by Model 2, 120 percent of the poverty line. Thus for sample parents with incomes below 120 percent of the 1993 U.S. poverty line for a single person aged 65 or over, policy experiment 2 has no effect on Social Security benefits.

PRA holdings may be withdrawn lump-sum by the parent, in which case her bequeathable and consumable assets increase by the expected present value of the annuities she would have received from the PRA, and the parent forfeits the longevity insurance associated with the annuitized benefit. Alternatively, the parent may choose not to withdraw the PRA funds, in which case she receives an annuity based on the value of the PRA after accounting for the cost of making PRA funds bequeathable.

For parents who cash out their PRAs, the bequeathability of the Social Security benefit has changed, in that, like liquid assets, unconsumed PRA dollars may be bequeathed to children at the time of the parents' deaths. For parents who choose annuitized payments based on the values of their PRAs, a bequeathable component is added to the benefit as a part of the reform. Parents may bequeath the expected values of their PRA annuity payments to their children. Thus each withdrawal option decreases parents' Social Security annuities in order to allow some portion of assets to be

[16] See, for example, the report of the President's Commission (2001), Cogan and Mitchell (2002) and Mitchell (2002).

bequeathed, with the lump-sum payment option removing the annuity portion of the benefit altogether. Each option also ensures income security, as public pension claims below a government-determined income floor remain fully annuitized.

Again, it is important to emphasize that this policy simulation cannot take into account differences in the rates of return and risk for standard Social Security savings and payroll taxes diverted to PRAs, or changes in the work-life savings behavior of individuals in response to changes in the retirement benefit structure, rates of return or risk. As in policy experiment 1, the goal of this experiment is to examine the response of family-derived long-term care to a plausible change in the bequest wealth of elderly U.S. parents. While policy experiment 1 seeks to determine whether a change in the rate of family caregiving could be achieved with a large change in the bequeathability of existing retirement assets alone, this second policy simulation asks how the amount of care elderly parents receive from children would respond to more moderate changes (that remain completely unexpected) in several dimensions of the structure of Social Security benefits that reflect a reform proposal actually under consideration.

Policy simulation results The results of the two experiments, in terms of predicted care and life insurance ownership, are reported in table 8. I find that the proportion of unmarried, disabled elderly parents who receive ongoing care from their adult children is increased by between 5 and 6.5 percent with the shift from annuitized to bequeathable public and private retirement benefits enacted as policy experiment 1. The smaller increase in the rate of family care is experienced by parents in the lowest quintile of the parental wealth distribution, and parents in the higher four quintiles of the parental wealth distribution experience increases in care rates of roughly 6 percent or more.

Imposing budget neutrality on this change in retirement benefits decreases parents' annuity incomes by 40 percent on average in the sample. Thus the model estimates imply that a small but non-negligible increase in family care could be obtained through a shift from fully annuitized to partially bequeathable retirement benefits, holding the total retirement assets of older parents fixed. The improvement in the rate of family care, however, must be associated with a substantial decrease in annuities paid out of or contributions paid into retirement funds. For this reason, welfare calculations based on the simulated outcomes indicate that the welfare of the average parent is not improved

by this extreme shift into bequeathable retirement benefits. Important caveats accompanying this claim include that the benefit change is completely unexpected, so that parents in the simulations have no opportunity to respond in an optimal manner in their work-life savings behavior, and the welfare calculations assume that parents do not benefit from increased bequests to their children in the absence of exchange for care.

Policy experiment 2 simulations predict negligible or slightly negative changes in the rates at which parents receive care from their children after the reform. Care provided to parents in the lowest quintile of the parental wealth distribution experience a .66 percent decrease in family care with the reform, parents in the third quintile see only a .33 percent decrease in rate at which care is provided by their children and parents in the highest wealth quintile experience a 1.98 percent decrease in family care receipt. The reasoning behind this effect is evident in the changes in predicted proportions of families in outcome categories (a) through (d) in the bottom panel of table 8. While the increase in the net bequests available for children after the reform leads to an increase in the rate at which parents receive care from their children without the purchase of life insurance, represented in table 8 by increased sample proportions in category (b), the decrease in annuity income with the reform implies an increase in the marginal utility of consumption and therefore the cost of life insurance required for care to some parents, moving parents from outcome categories (a) and (b) before the reform to category (c) after the reform. Welfare effects of this reform are mixed, even among parents predicted to receive care less frequently under the reform than in the baseline simulation. Though annuity incomes are lowered enough by the reform to lead some parents to go without family care, and the associated On net, the arguably more realistic change in the income security, withdrawal choice and bequest characteristics of Social Security simulated in policy experiment 2 leads to no change or a small negative change in the rate of elder care and mixed changes in the welfare of parents. Again, we must note that effects of the simulated reform on rates of return and parents' pre-retirement saving are not included in the simulation, and the welfare analysis ignores any benefit parents may experience from increased bequests to their children that are independent of children's caregiving decisions.

6. Conclusions

Though much of the long-term care provided to the elderly in the U.S. is supplied by children of the elderly, only a small minority of parents who receive care from children claim to pay them directly for care. This study seeks to determine whether caregiving children are likely to be compensated indirectly through end-of-life transfers. Given that this substantial transfer of time from adult children to their elderly parents is not compensated directly, I examine the relationship between end-of-life transfers and the care parents receive or expect to receive from their children.

Data drawn from the AHEAD study are uniquely suited to examine the relationships between intergenerational transfers and long-term care within the family. The AHEAD data offer information on parents' bequeathable assets and intended end-of-life transfers to their children, hours and types of care supplied to respondents by their children and other helpers and demographic information on children who do and do not provide ongoing assistance to their parents. Estimates of the dependence of end-of-life transfer allocations among siblings on the siblings' characteristics indicate that parents give more end-of-life transfers to children who provide them with regular care, that transfer amounts increase with the hours of care provided by children and that parents who do not currently require care give more to the children that they expect to assist them should the need arise. Parents with current care needs, whose expectations about which children will provide care in the future are unobservable, transfer more not only to current caregivers but to children with fewer own family obligations, characteristics associated with a greater likelihood of providing care for the parent in the future.

The model presented in section 4 of the paper specifies an exchange motive for the accumulation of bequeathable assets by a parent who is in need of long-term care. Financial and non-financial assets held in retirement, including public and private pensions, bequeathable wealth, and term life insurance, contribute differently to the parent's consumption and her ability to promise end-of-life transfers to her child over time. The child's decision whether to provide elder care to the parent may depend on both expected transfers and altruistic concern for the parent's well-being. The model produces separate expressions for parental demand for bequeathable assets and life insurance, and predicts life insurance ownership patterns that resemble the annuity offset behavior

evidenced in Bernheim (1991). Further, the exchange hypothesis implies that the level of end-of-life transfers at which the child is willing to care for the parent increases with the cost of the child's time.

Data from the AHEAD study on single, widowed or divorced parents with current long-term care needs and their children are employed in the estimation. The behavioral model is estimated, and model estimates indicate that children respond to parents' bequeathable assets in the decision to provide elder care. Additionally, children with more education provide care only at higher levels of expected end-of-life transfers, and this positive association between education and transfers in the presence of care is observed when controlling for other factors that may affect the relationship through the underlying model structure. These findings are consistent with the predictions of the exchange model. However, the model estimates also indicate that altruism toward parents plays a substantial role in children's decision to provide elder care. According to the estimates, 24% of children provide care to parents independent of expected transfers, and children whose parents require more assistance with IADLs, though not ADLs, supply more care at any bequest level.

Lastly, a policy experiment based on model estimates suggests that a large shift in existing annuitized pension benefits to a more bequeathable structure could induce an increase in the proportion of parents receiving care from children. However, the increase in the proportion receiving care is likely to be small relative to the decrease in annuity benefits required to fund the bequest.

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Table 1: Sources of Care Excluding Spouse

Respondent Receives	Full Sample (N = 8222)	Restricted Sample (N = 1381)
Any Care	20.89 %	64.63 %
	1717	893
Care from Child	14.44 %	52.78 %
	1187	729
Care from Other Relatives	2.12 %	3.26 %
	174	45
Care from Non-Relatives	4.75 %	12.28 %
	390	170
Care from Organizations	3.84 %	9.89 %
	316	137

Table 2: Hours of Care Per Month Conditional on Care Receipt

	Hours of Care Mean (SD)	
Care Source	**Full Sample**	**Restricted Sample**
All Helpers	117.34 (198.61)	122.44 (190.39)
	N = 1679	N = 890
Child	116.26 (201.37)	112.74 (186.78)
	N = 1151	N = 724
Other Relatives	57.26 (127.26)	52.03 (65.18)
	N = 183	N = 49
Non-Relatives	88.64 (156.56)	84.51 (139.39)
	N = 383	N = 174
Organizations	54.25 (97.09)	75.46 (119.21)
	N = 307	N = 134

Table 3: Transfers and Care, Only Children

Bequest or Life Insurance to child	Care from child		Total by bequest/ life insurance
	no	**yes**	
no	98	21	119
	36.57%	7.84	44.40%
	51.04	27.63	
	82.35	17.65	
yes	94	55	149
	35.07	20.52	55.60%
	48.96	72.37	
	63.09	36.91	
Total by care	192	76	268
	71.64%	28.36%	

Table 4: Fixed Effect Regressions of End-of-Life Transfers on Child Characteristics

Independent Variable	Care needs				No care needs	
	(1)	(2)	(3)	(4)	(5)	(6)
Sex of child	596.77	391.47	1450.08	1240.01	1079.60	390.64
	(2517.2)	(2517.6)	(2505.4)	(2506.5)	(4087.3)	(4090.0)
Age of child	315.68	341.84*	294.62	322.89	-215.84	-282.88
	(195.7)	(196.3)	(196.4)	(197.0)	(326.0)	(327.9)
Child's years of education	329.22	311.51	300.35	299.25	803.85	1008.05
	(634.3)	(639.0)	(637.7)	(642.6)	(985.2)	(1023.0)
Child's marital status (m=1)	-5534.97**	-5221.85*	-5701.95**	-5274.84*	-899.72	1.36
	(2795.8)	(3009.9)	(2812.8)	(3026.1)	(4874.3)	(5095.9)
# of child's children	-1288.76*	-1200.13*	-1305.53*	-1216.22*	632.89	748.17
	(717.7)	(718.2)	(720.7)	(721.2)	(1429.9)	(1428.9)
Biological or adopted child of p	27,904.63†	27,475.90†	28,344.16†	27,881.83†	57,779.10†	58,272.44†
	(6900.4)	(6896.0)	(6927.0)	(6923.3)	(9518.5)	(9503.2)
Child earns ≥30,000	-	609.36	-	121.15	-	-5003.83
		(3730.0)		(3741.4)		(5811.5)
Parent unsure ≥30,000	-	-7164.19*	-	-7396.68*	-	11,890.48
		(3928.2)		(3957.0)		(7696.7)
Child supplies Care indicator	12,026.29†	11,639.19†	-	-	-	-
	(3837.3)	(3847.8)				
Weekly hours of care from child	-	-	160.43*	142.75	-	-
			(88.48)	(88.92)		
Child expected to care if needed	-	-	-	-	21,164.85†	21,166.62†
					(6602.1)	(6601.1)
R^2	0.6137	0.6158	0.6105	0.6126	0.6265	0.6292
F test of H_0 : $\alpha_i = \alpha_0\ \forall i$	3.64	3.61	3.59	3.55	3.56	3.59
$\Pr(F(n,d) > f)^a$	<.01	<.01	<.01	<.01	<.01	<.01

a: Bequest sample with care needs, 260 families, 1055 children; bequest sample without care needs, 266 families, 999 children. * indicates significance at the 10 percent level, ** at the 5 percent level and † at the 1 percent level.

Table 5: Dissaving Path (i)-(iv) Regions of the State Space

(i)	$B_{t-1} < \frac{R}{\pi(1+r)^2}$	$A < \overline{A}$ $s.t.\ V^L(B_{t-1}, \overline{A}, R) = V^N(B_{t-1}, \overline{A}, R)$
(ii)	$B_{t-1} < \frac{R}{\pi(1+r)^2}$	$A \geq \overline{A}$ $s.t.\ V^L(B_{t-1}, \overline{A}, R) = V^N(B_{t-1}, \overline{A}, R)$
(iii)	$B_{t-1} \geq \frac{R}{\pi(1+r)^2}$	$A \geq \overline{\overline{A}}$ $s.t.\ V^L(\frac{R}{\pi(1+r)}, \overline{\overline{A}}, R) = V^N(\frac{R}{\pi(1+r)}, \overline{\overline{A}}, R)$
(iv)	$B_{t-1} \geq \frac{R}{\pi(1+r)^2}$	$A < \overline{\overline{A}}$ $s.t.\ V^L(\frac{R}{\pi(1+r)}, \overline{\overline{A}}, R) = V^N(\frac{R}{\pi(1+r)}, \overline{\overline{A}}, R)$

Table 6: Maximum Likelihood Estimates of Reservation Value and Preference Distributions

Parameters (Coefficient on)	$X_i\alpha$ Specification **(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Constant	10.6513	4.2922	3.7595	5.5194	9.8965	6.8992
	(1.7217)	(1.1854)	(1.6217)	(1.0553)	(0.8676)	(1.3650)
Minimum Child Education	-	0.5685		0.2595	-	0.2093
		(0.1362)		(0.0781)		(0.0840)
Predicted Child's Education	-	-	0.5168	-	-	-
			(0.1713)			
Child's Marital Status	-	-	0.9289	-	-	-
			(0.9869)			
Number of Children	-	-	-	-	-0.3344	-0.2271
					(0.1252)	(0.1291)
ADLs	-	-	-	0.0778	0.0913	0.0660
				(0.1587)	(0.1623)	(0.1380)
IADLs	-	-	-	-1.8918	-2.0170	-1.9667
				(0.2089)	(0.2213)	(0.2079)
$\ln\lambda$	-0.1001	-0.2253	-0.2817	0.6904	0.6781	0.6956
	(0.4048)	(0.3281)	(0.3712)	(0.1425)	(0.1380)	(0.1361)
$\ln\sigma_\varepsilon$	3.1636	3.1420	3.1765	2.1127	2.1421	2.1043
	(0.2172)	(0.1823)	(0.1955)	(0.1300)	(0.1265)	(0.1223)
μ_η	-2.4670	-2.4457	-2.4453	-2.4688	-2.4765	-2.4738
	(0.2876)	(0.3023)	(0.3025)	(0.3106)	(0.3122)	(0.3114)
$\ln\sigma_\eta$	0.8049	0.7959	0.7967	0.7917	0.7941	0.7930
	(0.0964)	(0.1019)	(0.1020)	(0.1043)	(0.1046)	(0.1044)
Log Likelihood	-1555.00	−1360.15	-1365.43	-1318.32	-1319.58	-1316.83
N =	1043	912	912	912	912	912

Asymptotic standard errors in parentheses. B_i, L_i and A_i in units of 2000 1993 dollars.

Table 7: Simulated Life Insurance, Care Outcome Rates

	Proportion in outcome category			
	(a) $L_i > 0, z_i = 1$	(b) $L_i = 0, z_i = 1$	(c) $L_i = 0, z_i = 0$	(d) $L_i > 0, z_i = 0$
Data	.1261	.2863	.4308	.1562
Simulation	.0853	.2815	.5449	.0884

Simulation based on specification (6) parameter estimates. Rates averaged over 1000 simulated outcomes.

Table 8: Pension Reform Experiments

		Proportion in outcome category				
	B_i Quintile	(a) $L_i > 0$, $z_i = 1$	(b) $L_i = 0$, $z_i = 1$	(c) $L_i = 0$, $z_i = 0$	(d) $L_i > 0$, $z_i = 0$	With care
Baseline	1	.0769	.2428	.5884	.0919	.3197
Simulation	2	.0792	.2408	.5838	.0962	.3200
	3	.0785	.2465	.5808	.0942	.3250
	4	.0838	.2911	.387	.08678	.3749
	5	.1081	.3861	.4328	.0730	.4942
	Average	.0853	.2815	.5449	.0884	.3668
Policy	1	.0720	.2977	.5431	.0871	.3697
Experiment 1	2	.0725	.3080	.5308	.0883	.3805
	3	.0731	.3170	.5241	.0858	.3901
	4	.0777	.3646	.4843	.0738	.4423
	5	.1015	.4534	.3851	.0600	.5549
	Average	.0794	.34814	.4935	.0790	.4275
Policy	1	.0667	.2464	.5927	.0942	.3131
Experiment 2	2	.0652	.2443	.5941	.0964	.3095
	3	.0637	.2580	.5869	.0913	.3217
	4	.0672	.2933	.5532	.0863	.3605
	5	.0824	.3920	.4559	.0697	.4744
	Average	.0690	.2868	.5566	.0876	.3558